

**CLAIMS:**

- 1           1.       A method of converting a first key value for a first communications  
2 system to a second key value of a second communications, said method comprising:  
3           generating a first intermediate value from at least a portion of said first key  
4 value using a first random function;  
5           providing at least a portion of said first intermediate value to a second random  
6 function to produce a second value;  
7           performing an exclusive-or on at least a portion of said first key value and at  
8 least a portion of said second value to generate a second intermediate value;  
9           providing at least a portion of said second intermediate value to a third  
10 random function to produce a third value; and  
11           producing at least a first portion of said second key value by performing an  
12 exclusive-or on at least a portion of said third value and at least a portion of said first  
13 intermediate value.
- 1           2.       The method of claim 1 comprising:  
2           producing at least a portion of said second intermediate value as at least a  
3 second portion of said second key value.
- 1           3.       The method of claim 1 wherein said generating comprises the step of:  
2           providing said first key value of m bits to a first random function to produce  
3 said first intermediate value of n-m bits.
- 1           4.       The method of claim 3 wherein said first steps of providing and  
2 performing comprise:  
3           providing said n-m bit first intermediate value to a second random function to  
4 produce an m bit second value; and

5 performing an exclusive-or on said m bit first key value and said m bit second  
6 value to generate said second intermediate value with m bits.

1 5. The method of claim 4 wherein said second step of providing and said  
2 step of producing comprise:

3 providing said m bit second intermediate value to a third random function to  
4 produce a n-m bit third value; and

5 performing an exclusive-or on said n-m bit third value and said n-m bit first  
6 intermediate value to generate an n-m bit portion of said second key value.

1 6. The method of claim 5 comprising:

2 providing said m bit second intermediate value as an m bit second portion of  
3 said second key value having n bits.

1 7. The method of claim 2 further comprising the steps of:

2 providing said second portion of said second key value to said third random  
3 function to produce said third value; and

4 generating said first intermediate value by subjecting said first portion of said  
5 second key value to an exclusive-or with said third value.

1 8. The method of claim 7 further comprises:

2 using said second random function to generate said second value from said  
3 first intermediate value; and

4 producing at least a portion of said first key by subjecting said second value to  
5 an exclusive-or with said second portion of said second key value.

1 9. The method of claim 6 further comprises:

2 providing said m bit first portion of said n bit second key value to said third  
3 random function to produce said n-m bit third value; and

4           generating said n-m bit first intermediate value using an exclusive-or of said  
5   n-m bit second portion of said n bit second key value with said n-m bit third value.

1           10.    The method of claim 9 further comprises:  
2           providing said n-m first intermediate value to said second random function to  
3   generate an m bit second value; and  
4           producing said portion of said first key value having m bits by using an  
5   exclusive-or of said m bit first portion of said second key value with said m bit second  
6   value.

1           11.    A key conversion system for converting a first key value for a first  
2   communications system to a second key value of a second communications, said  
3   system comprising:  
4           processing circuitry adapted to generate a first intermediate value from at least  
5   a portion of said first key value using a first random function to provide at least a  
6   portion of said first intermediate value to a second random function to produce a  
7   second value, to perform an exclusive-or on at least a portion of said first key value  
8   and at least a portion of said second value to generate a second intermediate value, to  
9   provide at least a portion of said second intermediate value to a third random function  
10   to produce a third value and to produce at least a first portion of said second key value  
11   by subjecting at least a portion of said third value to an exclusive-or with at least a  
12   portion of said first intermediate value.

1           12.    The system of claim 11 wherein said processing circuitry further  
2   configured to produce at least a portion of said second intermediate value as at least a  
3   second portion of said second key value.

1           13.    The system of claim 12 wherein said processing circuitry further  
2   configured to provide said first key value of m bits to a first random function to  
3   produce said first intermediate value of n-m bits.

1           14.    The system of claim 13 wherein said processing circuitry further  
2   configured to provide said n-m bit first intermediate value to a second random  
3   function to produce an m bit second value and to perform an exclusive-or on said m  
4   bit first key value and said m bit second value to generate said second intermediate  
5   value with m bits.

1           15.    The system of claim 14 wherein said processing circuitry configured to  
2   provide said m bit second intermediate value to a third random function to produce a  
3   n-m bit third value and to perform an exclusive-or on said n-m bit third value and said  
4   n-m bit first intermediate value to generate an n-m bit portion of said second key  
5   value.

1           16.    The system of claim 15 wherein said processing circuitry configured to  
2   provide said m bit second intermediate value as an m bit second portion of said  
3   second key value having n bits.

1           17.    The system of claim 12 wherein said processing circuitry configured to  
2   provide said second portion of said second key value to said third random function to  
3   produce said third value and to generate said first intermediate value by subjecting  
4   said first portion of said second key value to an exclusive-or with said third value.

1           18.    The system of claim 17 wherein said processing circuitry configured to  
2   use said second random function to generate said second value from said first  
3   intermediate value and produce at least a portion of said first key by subjecting said  
4   second value to an exclusive-or with said second portion of said second key value.

1           19.    The system of claim 16 wherein said processing circuitry configured to  
2   provide said m bit first portion of said n bit second key value to said third random  
3   function to produce said n-m bit third value and to generate said n-m bit first  
4   intermediate value using an exclusive-or of said n-m bit second portion of said n bit  
5   second key value with said n-m bit third value.

1           20.    The system of claim 19 wherein said processing circuitry is configured  
2   to provide said n-m first intermediate value to said second random function to  
3   generate an m bit second value and to produce said portion of said first key value  
4   having m bits by using an exclusive-or of said m bit first portion of said second key  
5   value with said m bit second value.